

REMARKS/ARGUMENTS

Applicant responds herein to the Office Action dated September 21, 2004.

Claims 1-12 stand rejected on grounds of obviousness over Moslehi (5,405,444), in view of JP63-166219. Reconsideration is requested in view of the following remarks.

The invention of independent claim 1 is directed to an apparatus used in conjunction with substrate treatment, relative to which it is very important to recognize two aspects. First, the surface of the substrate is heated intensely and in an extremely short time through the use of “a light source having a plurality of flash lamps”. Thus, a first key aspect resides in the use of flash lamps that heat through the medium of light.

Secondly, the invention of claim 1 utilizes a “light shield” that is provided in the substrate treatment chamber. The light shield is so structured, that it blocks “light emitted from said light source from reaching a metal surface inside said chamber”.

For a general background about “flash lamps”, please see the instant specification, page 13, line 18 to page 14, line 10, wherein a description is provided of the considerably high intensity heat that can be generated in a manner of an extremely short time period of about .1 to 10 milliseconds, to instantly heat the substrate up to 1,000°C to 1,100°C. Indeed, the process which utilizes flash lamps creates such an extremely intense flash light that it has the potential of impinging on the inner surface of the chamber, so as to cause the formation of an oxide film which disadvantageously can become a source of contamination, as described at page 2, lines 16-20 of the present specification. The claimed “light shield” of the present invention is particularly relevant in the context of using such flash lamps and, as noted above, provides the ability to shield, i.e., block the light from the flash lamps from disadvantageously affecting the inner surface of the chamber through the oxidation process mentioned above.

The applicant respectfully traverses the utilization of Moslehi as a primary reference because, in the first instance, this reference does not use, and does not describe any problem that might be associated and which is uniquely related with flash lamps. Rather, this reference discloses a heat treatment apparatus for a substrate that uses tungsten heating lamps, that do not heat with light, as such.

This reference does teach the utilization of a liner 62 made of quartz inside the chamber. However, the liner 62 of this primary reference is an environment separation element for separating the chamber process environment and the chamber walls. The described liner 62 is made of quartz, which allows light from the tungsten heating lamps to pass therethrough. Thus, aside from the very issue of whether this reference is applicable, inasmuch as it uses tungsten heating lamps, this document does not even provide any light shielding functionality to the extent that there is light produced by the tungsten heating lamps. Indeed, the Examiner's kind attention is directed to column 1, lines 33-39 of this reference, from where it is clearly apparent that nothing in this reference teaches including a light shielding function in the liner 62.

Nor does the secondary reference JP63-166219 supplement the gaps in the teachings of the primary reference. This secondary reference teaches a heat treatment apparatus that utilizes flash lamps. However, it is a reference that teaches the bare use of flash lamps, per se, without any further teachings of the deleterious effects of using flash lamps, or any hint or suggestion to use a light shield element at all. Indeed, even if the general knowledge of the use of flash lamps were to be utilized to suggest that the device of Moslehi should use flash lamps instead of tungsten heating lamps, the modified Moslehi apparatus would still not teach or suggest the present invention, because the liner of Moslehi, as already noted, provides no light shielding functionality and, as such, does not teach the structure, nor indeed, the functionality, of the apparatus of claim 1.

Accordingly, it is submitted that independent claim 1 and its dependent claims clearly distinguish over the prior art.

Turning to independent claim 8, it will be initially noted that this claim has been amended to ensure and make clear that the light source provides its heating function through the use of flash lamps. In addition, this independent claim 8 also recites: "a liner removably provided to said chamber along an inner wall side surface and an inner wall base surface of said chamber to cover said side and base surfaces".

The invention of claim 8 provides the benefit that the liner is removable. This is of considerable value because, as a substrate undergoes instant thermal expansion due to the intense heat that is applied to it in a very short time, the substrate may crack into fragments, as described

at page 3, lines 6-18 of the instant specification. The fragments of the substrate will typically fall onto the base surface. However, according to independent claim 8, not only the inner side wall surface, but also the base surface of the chamber, is covered by the removably liner. But the liner of claim 8 makes it possible to easily clean and remove those fragments from the chamber.

The apparatus disclosed in the primary Moslehi reference utilizes tungsten heating lamps, not flash lamps. Therefore, Moslehi does not have to consider a situation where the substrate undergoes rapid thermal expansion and the attendant real concern about cracking of the substrate into falling pieces. Further, the liner 62 of Moslehi covers the inner side surfaces inside a chamber. It does not cover the base surface. The Moslehi configuration is such that, if the substrate were to crack, the fragments would fall directly on its base surface and result in the need for a very complex and lengthy cleaning process.

Availing oneself of the teachings of JP63-166219 is not helpful. This reference does not teach any liner inside the chamber. Therefore, combining the disclosure of JP63-166219 with the primary teachings in Moslehi, still does not reach the present invention's recitation of a "liner removably provided to said chamber along an inner wall side surface and an inner wall base surface of said chamber", as recited in claim 8.

Based on the foregoing remarks, it is believed and strongly urged that claim 8 and its dependent claims similarly distinguish over the prior art, which does not suggest the same.

Accordingly, the Examiner is respectfully requested to reconsider the application, allow the claims as amended and pass this case to issue.

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as First Class Mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on December 21, 2004:

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Respectfully submitted,

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